

CLINICAL MORPHOLOGY VERSUS BACTERIOLOGY,

WITH SOME THERAPEUTIC DEDUCTIONS.

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Read before the Mississippi Valley Medical Association at its Fifteenth Annual Meeting September 11th, 1889,
and illustrated by lantern slides of microphotographs taken with the 1-4th, 1-10th
1-16th, 1-50th and 1-75th inch objectives of Tolles.

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The following is an abstract:—

WHAT IS CLINICAL MORPHOLOGY? Morphology is the science of form. Clinical Morphology covers the form elements that the clinician sees in his daily work with his patients; the position in bed; the lines of the face; the attitudes assumed in walking and sitting; all come under the term Clinical Morphology; but for our purpose to-day, we will consider Clinical Morphology to be the description of the form elements found in the blood, the urine, the sputum, the skin, the feces and foods.

WHAT IS BACTERIOLOGY? The science of Bacteria. What are Bacteria? Very small bodies which are hard to place. They have been classified under the heading of schizomycetes of the confervoid algae. A good definition of algae is, that they are plants that produce oxygen, and of fungi, that they are plants that produce carbonic acid gas.

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We now proceed to the concrete side of our subject, and will consider briefly the much advertised infants' foods, asthma, rheumatism and tuberculosis.

INFANTS' FOODS. It will go without saying that bacteriology has little field of work in the artificial infants' foods. Yet the opportunities offered for clinical morphological investigations are great and of much importance.

Take for instance, "Imperial Granum;" the author of the Clinical Morphologies, showed years ago that, though the claims of the manufacturers were that this preparation was 'amorphous, a solid extract, the salvator of the human race,' &c. &c., it was decidedly morphological, containing starch grains, to say no more, and the Connecticut Agricultural Experiment Station has backed up the statement of the morphologist by chemical examinations which show that "Imperial Granum" is common flour.

Any physician who has an infant food sent him for an examination should place the food under the microscope, study for gluten cells, starch cells, cellulose and the connective tissues of the various grains; see if it is an amorphous, homogeneous mass or made up of decidedly morphological elements. A food may be a first-class one chemically yet contain so much cellulose, that it is unfit for the stomach. The paper published in 1882 in Gaillard's Medical Journal, on Cereal Foods, by E. Cutter illustrated by cuts of micrographical drawings, created much attention as being the first to enter a new field as to foods, to wit: the morphological; chemistry and clinical morphology should go together.

* * * * *

The therapeutic deduction is: feed the mothers during gestation and lactation on such foods that they will have milk enough to nurse their children, summer or winter. Our plan is, two-thirds animal and one-third vegetable, with one meat and one vegetable at a meal.

MORPHOLOGY OF THE SPUTUM IN ASTHMA.

The following in quotations is from the work, entitled "The Clinical Morphologies," by Ephraim Cutter, M.D., LL.D. Published by the author, New York.

"Cholesterin;" "Cystin;" "Oxalate of Lime;" "Phosphate of Lime;" "Triple phosphates;" "Uric acid and urates;" "Calculi made up of these salts;" Contents of giant cells escaped outside of walls;" "Crystals with two or more terminals;" "Foreign substances inhaled;" "Fusiform crystals;" "Gravel crystalline, Gravel granular, Gravel massive;" "Mucous corpuscles distended with albumenoids; with crystalline and other bodies; with cystin; with giant cells; with melanotic matters; with oxalate of lime; with triple phosphates; with uric acid and urates." "Other crystals whose names have not been made out;" "Spirulina splendens, Salisbury, 1865."

The therapeutical indication from the morphology in asthma is to feed the cases so that there will be the minimum of fermentation and thus stop the paralyzing action of the carbonic acid &c. on the eliminative glands; give tonic and liquifying medicines and if the case is watched closely and will follow the orders to the letter, a cure may be expected in time. It hardly needs to be said that Bacteriology is far behind Clinical Morphology because it can only treat of Bacteria, yet Clinical Morphology is able to show physical causes of asthma and hay fever.

MORPHOLOGY OF THE BLOOD.*

MODE OF STUDY: "It is necessary to have the patient, the microscope, the light, the means of withdrawal of the blood—a lancet, spring lancet, the scarificator of the writer or a needle, which is not the best thing—all together."

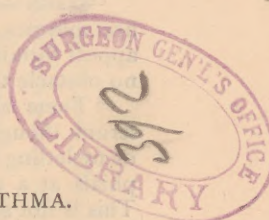
"There is no such thing as taking the blood home to examine. The changes are so rapid that most of the important ones disappear in ten minutes time. Still, after these are gone, many valuable points remain to be looked for.

"KIND OF BLOOD.—The capillary—not the venous or arterial.

"SITE OF WITHDRAWAL.—On the radial or ulnar side of the forearm near the wrist. The skin should be clean and free from hair. If dirty, wash with soapsuds or ammonia water. (It is well that the beginner should study the skin surface, dirt, and epithelium, before looking at the blood). Take the patient's forearm in hand, and make the skin tense in the interval between the thumb and fore-finger. Puncture the skin one-eighth inch. The tension of the grip will squeeze out a drop of blood. The size of the drop should bear a direct relation to the size of the cover. Very much depends on handling the drop of blood rightly. When the drop evenly diffuses itself it is to be presumed that the film is about uniform in thickness, so that one can judge somewhat as to the comparative number of corpuscles in each specimen. The process of

* See Clinical Morphologies, E. Cutter.

Cutter (J. A.)



presented by author

transferring the blood should take only a few seconds of time, a fraction should be sufficient.

"MORPHOLOGY OF THE BLOOD IN HEALTH."*

"Color ; bright, fresh, clear, ruddy, strong.

"Clotting ; rapid and firm.

"RED CORPUSCLES arrange themselves in nummulations, or are scattered evenly over the field. Normal in size. Non-adhesive. Central depression well marked on both sides ; periphery well rounded, clean cut. Hold coloring matter firmly. Pass readily to and fro through the fibrin filaments ; appear fresh and fair.

WHITE CORPUSCLES.—Normal in size. Not enlarged by internal collections of foreign bodies. Amoeboid movements, strong or not. Proportion, one to three hundred of red corpuscles. Consistence good. Not sticky. Color a clean white. Freely moving at will.

"SERUM—clear and free at sight from any form. After five minutes, most delicate semi-transparent fibrin filaments appear forming a very light network in the field, which offers no obstacle to the passage of the corpuscles.

"There should be no spores nor vegetation in healthy serum, though they may be found by very minute examination, or by letting the blood stand for several days in closely stopped phials at a temperature of from 60—75 degrees Fahrenheit. This is not saying that spores and filaments cannot be found in blood of persons calling themselves healthy—for some diseases exist in a latent condition, like rheumatism, syphilis, cystinæmia, and consumption. I have met with people who, on finding vegetations in their blood, have decided not to accept the evidence because they deemed themselves healthy. Again, it is difficult to find a perfectly healthy person in the community ; this was made public during the "late unpleasantness," when drafts were made for soldiers. The blood evidence must be taken in connection with that of other physical signs.

MORPHOLOGY OF THE BLOOD IN RHEUMATISM.

The red corpuscles are sticky, forming large masses ; this is due to the excessive development of the fibrin filaments which form a strong net-work across the field and render the blood molasses-like. The white corpuscles are distended more or less with the crystalline matters present.

In the serum interspaces, besides the fibrin filaments in excess, are found the following crystalline bodies : uric acid and urates ; phosphates, specially the triple phosphates of lime and soda ; oxalate of lime ; cystin, quite common and easily detected ; carbonate of lime, rare ; stelline and stellurine, these occurring mostly in granular form, but in old cases where the system is saturated, they are crystalline ; black, brown, aniline blue, bronze, red and yellow pigments in the form of flakes or small masses are common in rheumatic blood.

(Readers of this abstract will find this morphology described to a much greater extent in the Clinical Morphologies, E. Cutter).

"LATENT CONDITION OF THE CHARACTERISTICS OF RHEUMATIC BLOOD."*

"Themorphology of rheumatic blood exists in a latent condition in persons apparently well ; but when they are exposed to cold, the blood-vessels contract, catch and detain these abnormal elements, and we have a stasis of the blood which may be active or passive and manifests itself in heat, fever, pain, swelling, inflammation or passive congestion, effusion, etc., and which make up what is known as an "attack of rheumatism."

"Fibræmia* is where the fibrin is in excess in filaments, skeins, curled massive fibres like strings—thrombi and emboli. These are in a more exaggerated condition and form than in consumption or rheumatism, and are not necessarily associated with the crystalline matters or gravel. Sometimes the fibres look like a scalp that has been taken from the head of a woman with long tresses of hair.

"Thrombosis* is where masses of fibrin accrete and consolidate together, including or not the red corpuscles, white corpuscles, crystalline and pigmentary bodies, spores and mycelial filaments or vegetations, one or all.

"Embolism* is where a thrombus has been caught or engaged a blood-vessel and acts as a plug disturbing the circulation.

"PRE-EMBOLIC STATE.—As thrombi precede emboli, so they can be detected in the blood before the embolism, simply by the morphology of the blood. In this way, sudden deaths from embolism, specially in the puerperal state, can be averted."

Here again we have a subject which Bacteriology can not touch, as the morphology of the blood in rheumatism shows the causes of the inflammation, pain and deposits to be purely physical and chemical. Beef has had many sins that other foods should have borne the complaint of, laid at its door.

Stop the Englishman from eating his puddings, pastry and sweets and feed him on beef rightly prepared and I think he will have less gout. The morphology of the blood in these old cases of gout is very interesting and beautiful. One case I examined several years ago, had a most remarkable display of crystals of cystine.

To treat rheumatism, one must be patient ; sometimes the cases have to go on very rigid diet ; nothing but the beef separated from its fibrin, and the resultant pulp broiled. I wish to say here, that we never prescribe beef raw, never did and never will.

"MORPHOLOGY OF THE BLOOD IN TUBERCULOSIS."*

"FIRST OR INCUBATIVE STAGE.—Red corpuscles are less in number, ropy and sticky, more or less, but not much changed otherwise.

"SECOND STAGE OF TRANSMISSION.—Red corpuscles : color pale, non-lustrous ; not clear cut, not ruddy. Consistence, sticky, adhesive. Coating of neurine removed. Not so numerous as in normal blood. Owing to the increased size and strength of the fibrin filaments and the thickness, they form in ridges, rows, but not so marked as in rheumatic blood. They accumulate in aggregations of confused masses like droves of frightened sheep. They adhere to each other, and are rotten, as it were, in texture.

"WHITE CORPUSCLES.—Enlarged and distended by the mycoderma aceti or spores of vinegar yeast, that are transmitted into the blood stream from the intestines.

"SERUM.—More or less filled with the spores of mycoderma aceti or vinegar yeast. These occur either singly or in masses of spores which is the common form in which they are found, wherever vinegar is produced.

"THE FIBRIN FILAMENTS are larger, stronger, more massive than in health, and form under the microscope a thick network which is larger, stronger, and more marked in direct proportion to the severity of the disease or the amount of accumulation.

"Besides, the serum is apt to be of a dirty ash color.

"The sticky white corpuscles, the massive fibrin filaments in skeins, and the yeast spores alone or combined, form aggregations, collects, thrombi and emboli which block up the blood-vessels of the lungs soonest, because exposed to air the most of any viscus ; *the blood-vessels contract, and thus arrest the thrombi and form a heterologous deposit, which is called tubercle.*

"THE THIRD STAGE, OR STAGE OF TUBERCULAR DEPOSIT.—"These deposits increase so long as vitality subsists in the tubercle and surroundings. When vitality ceases, the tubercle softens and breaks down. Sometimes, if the process is very slow and life slightly inheres in it, the proximate tissue undergoes fatty infiltration, which preserves it from readily breaking down.

"The morphology of the blood is the same for the second and third stages of consumption.

"FOURTH STAGE, OR INTERSTITIAL DEATH.—Morphology of the blood in this stage is the same as in the second and third, save that it becomes more impoverished.

"THE RED CORPUSCLES are thinner, paler, much lessened in number ; increased in adhesiveness, stickiness, and poverty. Devoid, more or less of neurine.

"THE WHITE CORPUSCLES are fewer in number, more enlarged ; often ragged and rough. Distended with spores of mycoderma aceti ; more adhesive and sticky.

* See Clinical Morphologies, E. Cutter.

CLINICAL MORPHOLOGY VERSUS BACTERIOLOGY.

BY JOHN ASHBURTON CUTTER, M.D., B.SC.

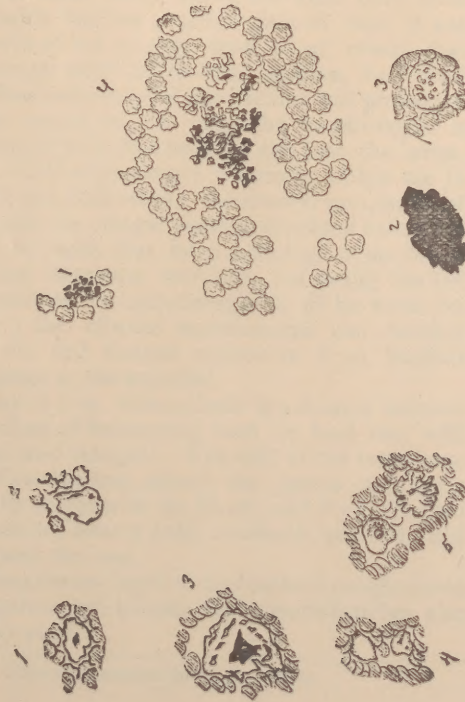


Fig. 1.

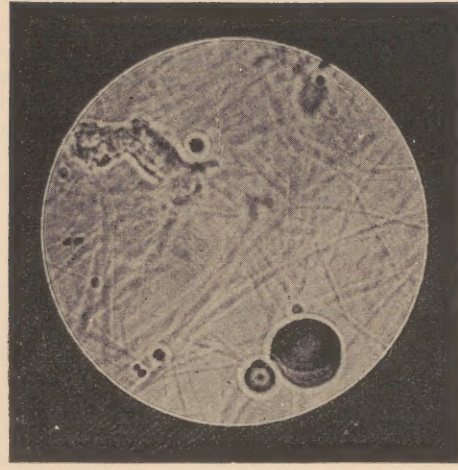


Fig. 5.

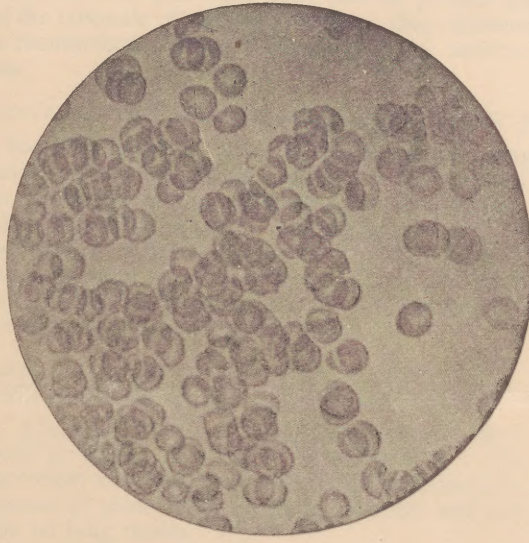


Fig. 4.

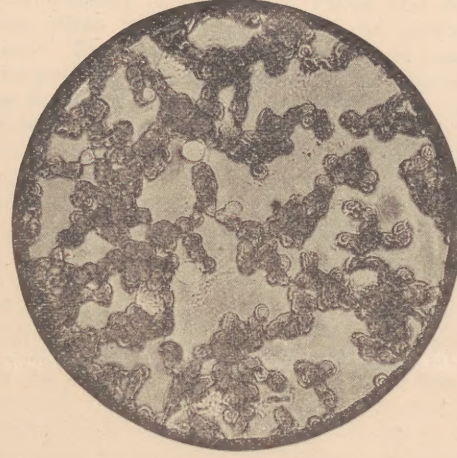


Fig. 6.

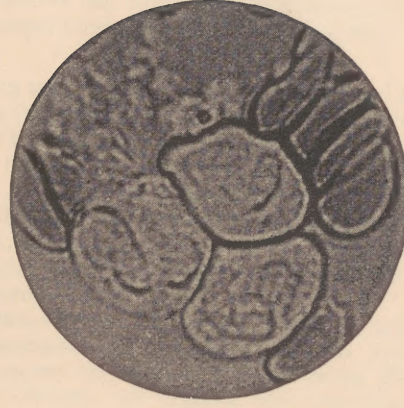


Fig. 7.

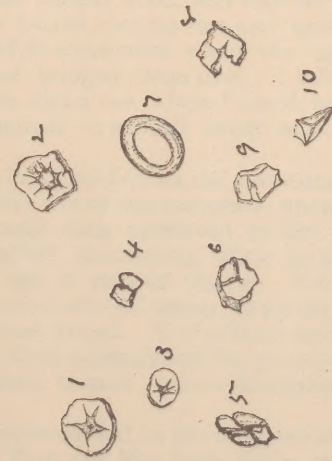


Fig. 3.

FIGURES 1 AND 2.—Crystals and crystalline bodies from the blood of rheumatic patients. (E. Cutter.)
FIGURE 4.—Microphotograph, healthy blood, 1-16th inch Tolles' objective, E. Cutter, 1883.

FIGURE 5.—Microphotograph, fibrin filaments in unhealthy blood. 1-50th inch Tolles' objective, E. Cutter, 1876. Taken with one form Cutter clinical microscope.

FIGURE 6.—Massing and crowding of red blood corpuscles; unhealthy blood. Microphotograph, 1876, G. B. Harriman and E. Cutter.

FIGURE 7.—Three white corpuscles enlarged with spores of vinegar yeast; the fourth ruptured; tuberculous blood. Microphotograph, 1-75th inch Tolles' objective, 1876, G. B. Harriman and E. Cutter

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"THE SERUM.—Fibrin filaments are thickened, stronger, more massive, and more skeins of them present. The collects of mycoderma aceti are very much larger and more numerous; in moribund cases, I have seen them so large as almost to fill the field of the microscope. They present anfractuous edges and amœboid prolongations, giving them a wierd, bizarre appearance which, under the circumstances, have a portentous aspect, for the larger and more numerous the spore collects of mycoderma aceti are, the more dangerous the case."

THE MORPHOLOGY OF THE BLOOD IN FIBROUS CONSUMPTION.

"Here the mycoderma aceti or vinegar yeast does not get into the blood and change it as in tubercular consumption, since the pylorus keeps the vinegar yeast in the stomach. There is breaking down of living tissue to a less extent. This tissue has been thickened, hardened, and made stony from deposit of gravel. The diagnosis is not so easy as that of tubercular consumption."

It is wonderful to see in these cases how soon the cough begins to lessen, due to the stopping of the production of the carbonic acid gas, which by its paralyzing action on the mucous membranes of the trachea and lungs, has caused that pouring out of mucous. I would that I had more time to go into the description of the rationale of the production of these diseased conditions in rheumatism, asthma and consumption, tubercular and fibrous.

"MORPHOLOGY OF THE SPUTUM IN TUBERCULOSIS." †

"Bacilli; bacteria, so-called; clots of blood; elastic lung fibers; epithelia, ciliate, non-ciliate, pavement and columnar; granular tubercular matter; granular tuberculous matter, so-called, sometimes fetid in odor; inelastic lung fibres; lumina of blood-vessels; mucous corpuscles, normal, deformed, distended with spores and gravelly matters; mucous filaments and fibres; mycelial filaments; swarms of spores; yeast plants; and yeast sporangia, alcoholic and lactic acid."

COMPARISON CLINICAL MORPHOLOGY AND BACTERIOLOGY AS TO TUBERCULOSIS.

ETIOLOGY: The bacteriologist claims that the tubercle bacillus as discovered by Koch is the cause of tuberculosis. The clinical morphologist asserts that the vinegar yeast spores in the blood is the cause of tuberculosis by their chemical and mechanical action on lung tissues.

The bacteriologist has strong evidence in the fact of inoculation. The clinical morphologist, in that by methods based on the morphology of blood containing vinegar yeast, many cases of tuberculosis have been cured. How can these two claims be reconciled? For over thirty years botanists have been fighting about Koch's bacillus; some claimed that it was part of the life growth of the vinegar yeast plant; others, that it was not. The former hold the stronger position, for Koch's experiments have demonstrated that the bacillus will propagate as itself; now here comes in the link; the bacteriologist is hard at work to find out how that bacillus gets into the lungs, and is laying down rules of preventive treatment which are in some cases fantastic and ridiculous; the clinical morphologist is able to diagnosticate the vinegar yeast in the blood before the lungs break down; he finds that the morphology of the blood improves as the case improves; moreover, not being limited to the study of bacteria as the bacteriologist is, (if he works on bacteriology alone,) the clinical morphologist can develop from the sputum the full fledged vegetation from bacillus through the spore stage to the mycelial.

Now if what I say is true, tuberculosis is a disease induced by the excessive feeding of fermenting food or food that will ferment into alcohol and vinegar? The villi of the intestines, paralyzed by this fermentation, absorb the spores of vinegar yeast which gradually increase in the blood, and if not detected in time, cause tubercle; often a cold, overwork or worry will be the blow that upsets the case.

Now when the lung tissues begin to necrose and cough comes on, of coarse the sputum will contain the tubercle bacillus, also the spores of vinegar yeast.

My father's experience which runs back over thirty-three years shows that children of tuberculous parents will by feeding on proper food grow up instead of dying.

* * * * *

Men say to me that they examine blood and can tell nothing about it. I answer that my father thought it necessary that I should spend eight years in the study of the sciences and medicine before he would teach me *how* to study clinical morphology. The same rule applies in his instruction to others for he will teach only medical graduates, among whom I may note Dr. R. J. Nunn, ex-President of the Medical Association of Georgia; Dr. Nunn traveled in Europe and could not find what he wanted till he returned to New York.

THERAPEUTICS. In 1881, a young man lay sick in bed, of emaciation so great that he was almost a skeleton; of hemoptyses so frequent that counting them had ceased; of night sweats; of copious expectoration which contained elastic and inelastic lung fibers. The heart was enlarged, the pulse 120, respiration 20 and more times a minute. In both lungs there were cavities. The blood presented the tuberculosis morphology. Now, this case, desperate as it was, was undertaken by my father. The patient was fed on beef taken from the top of the round. The fibrous tissues were separated from it by a machine, and the resultant pulp was moulded carefully into cakes, and broiled. Great care was taken in all the steps of the process of preparing the beef. The hands touched it as little as possible, for, even after the pulp has been separated from the fibrous tissues, if touched by the hand, the human animal-heat will be apt to change the condition of the meat, so it is moulded carefully with knife and fork. The meat was then broiled and seasoned to taste, with pepper, butter, lemon juice, and salt, as wanted. Worcester-shire sauce allowed. The patient was fed this three times a day, was given gentle tonics, and an ammonia or acid sponge bath twice a day. The case was very carefully watched, for life was likely to slip away at any moment. He gradually improved and was cured; i. e. the cough ceased, and the sweats were gone; he got up from his bed, went through college, was graduated with honors, was married, and last seen by us one year ago, and calls himself a well man. Now, what is the rationale of this cure? By feeding him this particular food, the vinegar yeast was starved out of the blood, and thus its work of necrosing lung tissues was stopped. The acidity of the blood was taken away by stopping the acetic acid fermentation, the fibrin filaments lost their large size, the red blood-corpuscles regained their normal tone and color, and were no longer huddled together; while the white corpuscles came down to normal size, because the blood had been deprived of the spores of vinegar yeast which they had been trying to enclose. Now, nature is a spiral spring, and in this case had been overloaded with wrong feeding. We had given her a chance by feeding the patient on the food that best agreed with her, and she being furnished with good blood, her eliminative glands in good condition, took the normal blood, and with her wonderful physiological means healed over the sore and broken down places in the lungs, and in some cases where the cavities were not too large, built and bridged them over. I believe this to be true, for I have been with a case where I could hear the air bubbling through the mucus in a small cavity, and yet that all disappeared.

There is so much said about the non-curability of consumption. My father was nearly ostracised when he came out, in 1880, with seventy cases published in the transactions of the American Medical Association, where he simply claimed that consumption was a curable disease. His cases in this table were: seventeen non-arrests, twenty-six partial arrests, and twenty-seven permanent arrests. It is perhaps well to note that this was all before Koch promulgated the tubercle bacillus, and with this article were printed micro-photographs of tuberculous blood.

Now, it is reported that, in the morgues of the great cities of the world like Paris and New York, bodies are cut into in which are evidences of lung necrosis which had been stayed, the lungs healed or scarred, and the individuals found dead from some other cause. Moreover, surgeons are talking of removing by pneumectomy, untold portions of the lungs, and in a journal

† See Clinical Morphologies, E. Cutter.

I recently saw that a man could live with but two lobes. Well, suppose the patient has survived the shock of slicing out a part or the whole of one lung, he will continue to live on the food that produces tubercle. These facts apply to tuberculosis of the joints and the peritoneum as well. In a case of tuberculosis of the knee joints, I found the morphology of the blood to be tuberculous and syphilitic. Gentlemen, the medical, the trophologic side of these questions must be examined as well as the surgical.

In our work we never say we are going to cure a case for we recognize the fact that we are human—finite; but we do know that cases have been cured, and so we will not take away a sufferer's hope. We never know how a case is going to turn out; some cases will not respond to treatment, for they are just full of the disease—both lungs; but others come along that appear quite as desperate, we give them a chance, and they pull up and get well.

I had a case of a woman in Kentucky; we healed her lungs several times and would send her home and there she would get upset; once she had to go into the kitchen and cook; this brought on an attack of meningitis which shattered her nervous system so that her character was changed from that of a bright, happy woman to one despondent nervous and irritable. Yet she lived for over a year after that meningitis, though I was constantly told that she would die. For seven months before her death she never coughed. I took her to her family physician and he admitted that her lung was healed. She died two months later, incidentally, from malaria; generally, from adynamia.

Gentlemen, it takes nerve force to live; it takes nerve force to get well. Each time this woman's lung broke down she had to use up nerve force to recover; if she had not been shattered by the meningitis, humanly speaking, she would be alive now.

(See "On the Death of a Cured Case of Tuberculosis Pulmonalis," J. A. Cutter, *Virginia Medical Monthly*, Sept. 1889.)

I might give you the details of many more cases of tubercle but time does not permit; suffice it that I say that the cured cases run back into the '60's, that we consider tuberculosis curable and our hope is that as soon as the profession and the laity share this belief and practice to cure, then many more lives will be saved.

This taking away of hope kills many. How can a man live if there is no hope offered him? If he does live, it is by sheer pluck and fight. But the battle which my father started in upon years ago to prove that consumption is a curable disease seems to be about over. We are entering on a new era in medicine. Nutrition of tissues must be studied, the causes of tumors, the excessive development of the fibrous tissues, the causes of degeneration, all these must be studied from the side of nutrition.

A few words as to foods in tuberculosis; the yolks of eggs are not allowed in any form, because hard to digest and a promoter of rheumatism; if you do not believe it try them on a case and see the result. Milk is commonly called the best of foods, yet in the adult nine times out of ten it is not the best as it so often causes biliousness. This we see in studying our cases. Testing the urine with nitric acid helps very much to show the biliousness. Milk if given to patients must be taken warm from the cow and be carried to the patient speedily, so that the ever present germs may not get into and contaminate it. But be careful in its administration. I have seen cases that I thought could take milk be upset by it.

Some cases are kept alive on the whites of eggs slightly cooked, beef tea and Johnston's extract of beef. Sometimes the

stomach is in such a condition that the patient has to be sustained by nourishment per rectum till the stomach comes around. But the aim in our cases is to get the stomach in such a condition that they can be fed beef prepared as before described. When the blood becomes normal, the urine flowing with a specific gravity of 1015 to 1020 with no bile and no sediment, then other foods can be brought in cautiously, and it is only necessary for me to say that if you are watching the case carefully, you will soon find out whether the food you are allowing is the best or not. Again, time is a great consideration with these cases. They must be treated by the month, pay their fee in advance, must go under your care for at least one year, or better two; the specimens of blood, urine, feces and sputum must be often examined. Have the patient put his hand in yours and trust you faithfully; make him stop introspection and watch to see that causes of worry are removed. Temperament needs consideration; some cases need much encouragement, others holding back; some are fearful of everybody and everything and have no faith; others expect to get well right off and go at the treatment with a rush, and when they find that nature takes her own time in healing their sins, they may be disappointed.

It is no easy thing to take a case chronically sick and lead him along to health. Again, while remembering that without proper feeding you cannot cure your case, do not forget that with judicious medication the case may be pushed along faster, for the machine needs oiling. Have the case drink hot water one hour before meals and on retiring; usually a pint is needed at each draught, the temperature not boiling but comfortably warm. (See "The Therapeutical Drinking of Hot Water," by E. Cutter, New York, W. A. Kellogg.) Do not give them any medicine that is made up with syrup. I have been asked so many times, "Do you give syrup of hypophosphites?" The answer is, "No, because there is fermentable matter in it."

In closing, gentlemen, I call your earnest attention to the need that large bodies of medical men, who are deeply anxious for the truth, should investigate the original experiments of Salisbury which were made on men and animals thirty years ago. Our work has been more with microphotography and demonstrations of healthy and diseased morphologies. We have not had the time nor money to hire men to eat certain kinds of foods, singly, and study the effects on them; neither to buy hogs and feed them to death on distillery slop. But all this must be done, and if this association with its personnel of scientific men industrious and anxious for therapeutic achievements, will appoint a commission and investigate these matters thoroughly, a great good will be conferred.

We must know the truth! These matters ought not to rest on the utterances of one or two men. While I am satisfied as far as I have gone in the matter, and while I believe my father to be on the right track in his efforts to save these things to the profession, still I am anxious that these experiments be repeated.

A commission to undertake this work must be composed of your most eminent members; it should contain a first-class chemist, a neurologist, a pathologist, a therapist, and last, but not least, a morphologist. The work of this commission must not be hampered by the appointment of a man to do its microscopical work who is trained only in bacteriology. I believe I have shown you that bacteriology is an extremely small portion of the micrological world, and that the profession will be handicapped until the word ceases to exist, and the bacteriologists of to-day become morphologists in order that they may cover the whole field.

The Ariston, Broadway and Fifty-fifth street.